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USING STATE-LEVEL EVIDENCE TO INFORM NATIONAL POLICY: RESEARCH FROM THE STATE HEALTH ACCESS REFORM EVALUATION (SHARE) PROGRAM

The Effects of Medicaid and CHIP Policy Changes on Receipt of Preventive Care among Children

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Objective. To examine changes in children's receipt of well-child and preventive dental care in Medicaid/Children's Health Insurance Program (CHIP) in two states that adopted policies aimed at promoting greater preventive care receipt.
Data Sources. The 2004–2008 Medicaid/CHIP claims and enrollment data from Idaho and Kentucky.
Study Design. Logistic and hazard pre–post regression models, controlling for age, gender, race/ethnicity, and eligibility category.
Data Extraction Methods. Claims and enrollment data were de-identified and merged.
Principal Findings. Increased reimbursement had a small, positive association with well-child care in Idaho, but no consistent effects were found in Kentucky. A premium forgiveness program in Idaho was associated with a substantial increase (between 20 and 113 percent) in receipt of any well-child care and quicker receipt of well-child care following enrollment. In Kentucky, children saw modest increases in receipt of preventive dental care and received such care more quickly following increased dental reimbursement, while the move to managed care in Idaho was associated with a small increase in receipt of preventive dental care.
Conclusions. Policy changes such as reimbursement increases, incentives, and delivery system changes can lead to increases in preventive care use among children in Medicaid and CHIP, but reported preventive care receipt still falls short of recommended levels.

Key Words. Medicaid and CHIP reimbursement, preventive care, incentives, managed care, children

Timely receipt of preventive medical and dental care for children is important for screening and early diagnosis of health problems, including developmental and behavioral problems that may require early intervention, and it has been shown to be associated with reductions in avoidable hospital admissions,

reductions in dental costs later in life, and improved child health (Hakim and Bye 2001; Savage et al. 2004). The American Academy of Pediatrics guidelines recommend that children ages 3–21 receive annual well-child visits and more frequent visits under age 3 (Hagan, Shaw, and Duncan 2008), while the American Academy of Pediatric Dentistry recommends semi-annual clinical oral examinations beginning at age 6–12 months (American Academy of Pediatric Dentistry 2009). National data indicate that the receipt of preventive care for children falls below recommended levels, particularly for children in low-income families (Selden 2006; Edelstein and Chinn 2009).

This study examines Medicaid and Children's Health Insurance Program (CHIP) policy changes in Kentucky and Idaho aimed at increasing use of preventive care among children. National surveys vary widely in their estimates of the share of Medicaid/CHIP children who received a well-child visit (40–91 percent) and a preventive dental visit (24–76 percent) over a 12-month period (Kenney, McFeeters, and Yee 2005; National Survey of Children's Health 2007; Perry and Kenney 2007). Medicaid covers well-child and preventive dental care under its Early and Periodic Screening, Diagnostic, and Treatment benefit. In CHIP, well-child care is mandatory; dental benefits have been included in almost all CHIP programs, though it was an optional benefit until CHIP was reauthorized in 2009 (Kaye, Pernice, and Cullen 2006).

Preventive care receipt likely falls below recommended levels because of both supply and demand barriers. Public programs often reimburse physicians and dentists at lower rates than commercial insurers (Berman et al. 2002; Zuckerman et al. 2004), and other payment issues (such as delays in reimbursement) may make providers less willing to provide services to children covered under these programs (Cunningham and O'Malley 2009). The literature suggests that higher Medicaid reimbursement rates can increase receipt of preventive care but that such an effect is not assured (Mayer et al. 2000; Hughes et al. 2005; McInerny, Cull, and Yudkowsky 2005; Shen and Zuckerman 2005).

In terms of demand barriers, some families may not place a high value on preventive services, particularly if their children appear to be healthy

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(Blumberg, O'Connor, and Kenney 2005), or they may face difficulty obtaining preventive medical and dental services due to language and transportation barriers, low quality of care, or discrimination (Cohen and Christakis 2006; Kelly et al. 2005). Evidence on past attempts to use incentives to raise the use of preventive services is mixed (Redmond, Solomon, and Lin 2007; Sutherland, Christianson, and Leatherman 2008). This paper examines whether reimbursement increases, incentives, and the adoption of managed care in two state Medicaid/CHIP programs led to greater preventive care receipt among publicly insured children.

BACKGROUND

Both Idaho and Kentucky have a combination CHIP program that uses the same delivery system for their Medicaid and separate CHIP programs. With the exception of 16 counties in the Louisville region of Kentucky, both states operate a fee-for-service primary care case management (PCCM) model (known as KenPac in Kentucky and Healthy Connections in Idaho).

In July 2006, Idaho and Kentucky used new authority granted under the Deficit Reduction Act of 2005 to implement a number of changes to their Medicaid programs (Table 1) (Kenney and Pelletier 2010; Kenney, Pelletier,

Table 1: Medicaid Policy Changes Regarding Well-Child and Preventive Dental Care for Children in Kentucky and Idaho, 2006–2007

Policy Change	*Effective Date*
Kentucky	
12.5% increase in provider reimbursement for well-child visits (from average of U.S.$74.91 to average of U.S.$84.28)	July 2007
Number of preventive dental visits covered for children increased from one to two per year	July 2006
30% increase for most dental services (from U.S.$37.00 to U.S.$48.10)	August 2006
Idaho	
8–24% increase in provider reimbursement for well-child visits (from average of U.S.$91.41 to average of U.S.$106.45)	July 2006
Premium forgiveness for children with family income between 134–185% FPL who stay up-to-date on recommended well-child visits and immunizations	January 2007
Dental coverage for Basic Plan enrollees outsourced to a managed care organization and reimbursement rates for children's services were increased by an average of 7.7%	September 2007

Sources: Kenney and Pelletier (2010); Kenney, Pelletier, and Costich (2010).

and Costich 2010). For the first time in over a decade, Kentucky increased reimbursement for preventive care services, by 12.5 percent for well-child visits in July 2007 (from U.S.$74.91 to U.S.$84.28[1]) and an additional 18 percent on average in January 2008 (to U.S.$99.34), and by 30 percent for dental checkups in August 2006 (from U.S.$37.00 to U.S.$48.10) (Kentucky Cabinet for Health and Family Services 2009). While comparable information is not available for Medicaid reimbursement rates on well-child visits from other states, in 2008, Medicaid reimbursement rates for all primary care services in Kentucky were 15 percent greater than the national Medicaid average (Zuckerman, Williams, and Stockley 2009) but were still 75 percent of commercial rates in the state (American Academy of Pediatrics 2009). The state also added a second annual preventive dental visit for children under age 21 beginning in July 2006.

In July 2006, Idaho increased reimbursement for well-child visits by an average of 18 percent (from U.S.$91.41 to U.S.$106.45) (Idaho Department of Health and Welfare 2009). In 2008, Medicaid reimbursement rates for all primary care services in Idaho were 48 percent greater than the national Medicaid average (Zuckerman, Williams, and Stockley 2009) and 97 percent of commercial rates in the state (American Academy of Pediatrics 2009). Both states also implemented benchmark benefit packages to different groups of enrollees based on their health needs. In Idaho, healthy, nondisabled children were placed in the Basic Plan while other children (such as those receiving Supplemental Security Income [SSI]) were placed in the Enhanced Plan that offers greater coverage of behavioral and mental health services (Kenney and Pelletier 2010). In Kentucky, most children were placed in the Family Choices plan, which is comparable to Idaho's Basic Plan (Kenney, Pelletier, and Costich 2010).

In January 2007, Idaho implemented a new Wellness Preventive Health Assistance benefit, an incentive program in which parents of children in the premium-paying eligibility groups (Basic Plan enrollees with income above 133 percent of the federal poverty level [FPL]) earn points every quarter that their children are up to date on well-child visits and immunizations, as verified in the claims records. Between January and September 2007, these points could be used by parents to pay delinquent premiums that were at least 2 months in arrears or to purchase car seats, bicycle helmets, or sports equipment with vouchers. In September 2007, a ruling from the Centers for Medicare and Medicaid Services (CMS) led the state to end the voucher program and allow points to be used to offset both delinquent and current premium payments. According to Idaho Medicaid officials, the share of premium-

paying children earning wellness points has been steadily increasing, from about 40 percent in April 2007 to 73 percent in the third quarter of calendar year 2009.

When children enroll in premium-paying categories in CHIP, their caregivers are notified about the premium schedule and the wellness incentives. Every quarter, caregivers are also notified in writing whether Medicaid records show that their children qualify for incentives based on receipt of recommended checkups or immunizations. The incentives were also advertised to providers and medical associations in newsletters, information flyers, and presentations at provider healthcare conferences across the state. Providers were also encouraged to use appropriate diagnosis and CPT codes when billing for well-child visits to ensure that patients received credit for staying up to date.

In September 2007, Idaho contracted with Blue Cross-DentaQuest, a managed care organization, to provide dental services to its nondisabled population under a new capitated program called Idaho Smiles. DentaQuest initially increased provider fees for children's services by an average of 7.7 percent and in 2008 increased fees another 3.2 percent (Kenney and Pelletier 2010). The number of private practice dentists that accept Medicaid patients has reportedly increased by 22 percent since the program began (Kenney and Pelletier 2010).

We hypothesize that the reimbursement increases, incentives, and delivery system changes could increase receipt of preventive care among children due to increased provider willingness to serve Medicaid-covered children and increased demand for care among premium-paying beneficiaries in Idaho due to the incentives.

Data and Methods[2]

Data

The analysis uses Medicaid and CHIP enrollment and claims for the periods before and after the policy changes were introduced. The study population is restricted to noninstitutionalized children (ages 0–18 for analyses of well-child visits and ages 3–18 for analyses of dental care). Claims data were merged with monthly enrollment files using encrypted identifiers. CPT and HCPCS codes were examined to determine whether a child received a well-child visit or a preventive dental visit in each month of enrollment.

In Idaho, children who only received services at community health centers and rural health centers are dropped, constituting 9.0 and 7.8 percent of the observations in the well-child and dental care analyses, respectively, due to the absence of claims data for these providers. In Kentucky, any months associated with managed care coverage are dropped (23.5 percent of the observations). In both states, any months with missing values for variables of interest are dropped, as well as months with dual Medicare coverage.

Analysis

Separate pre- and postperiods were defined for each state and each visit type due to differences in the timing of the policy changes (Tables 2 and 3). Pre–post models with a comparison group of children not affected by the particular policy change were used to estimate the effects of the wellness incentives and dental policy changes in Idaho; the reimbursement increases in Idaho and all the policy changes in Kentucky were assessed using a pre–post design.

Logistic Models. In the logistic models for well-child care, the dependent variable is whether or not a child received an annual well-child visit; in the models for dental care, it is whether or not a child received an annual preventive dental visit. The key independent variable for assessing the impact of the reimbursement increases in each state is a time-varying indicator that equals 1 in the time period after the reimbursement rate increase takes place and is zero in the preperiod. Note that we estimate a difference-in-difference version of the dental model for Idaho in which we include SSI and Foster Care children as a comparison group. The key independent variable in that model is an interaction between indicators for eligibility for dental managed care and a time-varying indicator that equals 1 in the time period after the managed care program is in place. Likewise, the impact of the wellness incentives in Idaho is analyzed using a difference-in-difference logistic model with Medicaid recipients who are not eligible for the program included to serve as a comparison group. The key independent variables are interactions between indicators for eligibility for the wellness incentives and a time-varying indicator that equals 1 in the time period after the incentive program is in place.

We also control for a vector of demographic characteristics and a vector of eligibility category indicators, each of which is described in detail in Appendix SA2. In Idaho, the well-child model is run separately on children

Table 2: Descriptive Analysis of Receipt of Well-Child and Preventive Dental Visits in Kentucky before and after Reform

	Well-Child Visit			*Preventive Dental Visit*		
	Sample Size	*Prereform July 2004–June 2007 (%)*	*Postreform July 2007–June 2008 (%)*	*Sample Size*	*Prereform July 2004–June 2006 (%)*	*Postreform July 2006–June 2008 (%)*
All children age 18 and under[†]	584,707	40.6	40.6	520,122	36.7	43.8**
Age[‡]						
Under 6	171,482	67.4	68.2**	106,897	27.9	35.5**
6–18 years	413,225	29.5	29.3	413,225	39.0	45.9**
Eligibility category						
Temporary assistance to needy families	194,257	40.0	40.5*	174,496	33.9	38.7**
KCHIP	68,263	34.3	33.9	65,824	45.1	52.0**
Foster care	35,930	43.6	43.9	34,150	44.8	52.2**
Pregnant women and children	254,221	43.8	43.5	214,155	37.9	43.9**
Supplemental security income	32,036	29.2	30.4*	31,497	28.4	34.4**
Gender						
Male	299,180	39.4	39.4	265,978	34.7	41.7**
Female	285,527	41.9	41.8	254,144	38.7	46.0**
Race/ethnicity						
White non-Hispanic	529,323	40.1	40.1	470,986	36.9	44.1**
Nonwhite or Hispanic	55,384	45.9	45.6	49,136	34.3	40.9**
County of residence						
Metropolitan	179,800	44.9	45.1	156,506	36.3	43.0**
Nonmetropolitan	404,907	38.7	38.5	363,616	36.8	44.2**
Managed care[§]	179,985	56.8	58.7**	158,316	35.1	42.4**

Note. Percents are calculated by child-year, so children enrolled in more than 1 year contribute more than one observation to the estimates.

[†]Excludes children in the 16 counties served by a managed care plan.

[‡]Only ages 3–5 included for dental analysis.

[§]Not included in analytic sample.

*p-value difference between pre- and postreform $<.05$.

**p-value difference between pre- and postreform $<.01$.

Source: State Medicaid claims and enrollment files, 2004–2008.

Table 3: Descriptive Analysis of Receipt of Well-Child and Preventive Dental Visits in Idaho before and after Reform

		Well-Child Visit			*Preventive Dental Visit*	
	Sample Size	*Prereform January 2004–December 2006 (%)*	*Postreform January 2007–December 2008 (%)*	*Sample Size*	*Prereform September 2004–August 2007 (%)*	*Postreform September 2007–August 2008 (%)*
All children ages 0–18	311,533	28.1	31.0**	215,119	55.2	57.1**
Age and eligibility category[†]						
Children under 6	116,940	49.3	51.0**	54,355	48.1	53.1**
Medicaid ≤ 133% FPL[‡]	109,756	49.4	50.7**	51,012	48.0	53.3**
Wellness incentives CHIP 134–150% FPL[‡]	1,903	50.5	56.3*	1,264	56.2	54.5
Wellness incentives CHIP 151–185% FPL	1,541	53.1	64.6**	NA	NA	NA
Supplemental security income	2,031	44.0	45.8	1,189	41.5	46.3
Foster care	1,709	48.3	52.0	890	51.9	49.2
Children ages 6–18	194,593	15.6	18.6**	160,764	57.5	58.5**
Medicaid ≤ 133% FPL[‡]	151,062	15.2	17.3**	126,238	57.1	58.7**
Wellness incentives CHIP 101–150% FPL[‡,§]	23,743	16.0	20.3**	20,491	63.3	60.4**
Wellness incentives CHIP 151–185% FPL	2,567	18.6	41.2**	NA	NA	NA
Supplemental security income	11,888	17.3	22.4**	9,679	50.1	51.5
Foster care	5,333	20.8	22.3	4,356	59.0	57.5
Gender						
Male	158,934	28.5	31.0**	109,083	53.9	55.9**
Female	152,599	27.7	30.9**	106,036	56.5	58.3**
Race/Ethnicity						
White non-Hispanic	297,505	28.2	31.2**	205,230	55.3	57.3**
Nonwhite or Hispanic	14,028	26.2	26.4	9,889	51.3	53.7*

continued

Table 3. *Continued*

	Well-Child Visit			*Preventive Dental Visit*		
	Sample Size	*Prereform January 2004–December 2006 (%)*	*Postreform January 2007–December 2008 (%)*	*Sample Size*	*Prereform September 2004–August 2007 (%)*	*Postreform September 2007–August 2008 (%)*
Medicaid region of residence						
1	38,713	31.8	35.2**	27,202	47.0	43.8**
2	17,313	32.5	35.9**	12,060	41.5	39.8
3	64,380	20.1	21.4**	45,043	58.0	62.9**
4	57,599	31.3	33.9**	39,624	57.6	62.5**
5	43,498	24.2	25.8**	30,359	53.3	51.9*
6	42,145	27.5	30.1**	28,960	60.4	62.9**
7	47,885	34.5	40.7**	31,871	57.1	59.5**
Receipt of services at an FQHC						
None	242,841	31.5	35.9**	169,420	51.7	52.8**
Some	68,692	15.2	15.7*	45,699	68.7	71.3**

Note. Percents are calculated by child-year, so children enrolled in more than 1 year contribute more than one observation to the estimates.

[†]Only ages 3–5 included for dental analysis. Higher-income CHIP children excluded from dental analysis due to lack of full dental benefits before July 2006.

[‡]Group moved to managed care delivery of dental care in the postreform period.

[§]Only children with family income between 134 and 150% FPL are enrolled in CHIP and therefore eligible for wellness incentives, but this group cannot be distinguished from those with family income between 101 and 133% FPL.

*p-value difference between pre- and postreform $<.05$.

**p-value difference between pre- and postreform $<.01$.

Source: State Medicaid claims and enrollment files, 2004–2008.

aged 0–5 and children aged 6–18. There is measurement error in the variable that identifies the older children (ages 6–18) who are eligible for the incentive payments since that variable includes children between 101 and 133 percent FPL and children in the Enhanced Benefit Plan who were not made eligible for the incentives. Together, these children comprise around 75 percent of this group. Therefore, the impact estimates are biased downward for older children.

Hazard Models. Hazard models are estimated to examine the time (measured in months) from enrollment in Medicaid or CHIP to the month of a child's first well-child or preventive dental visit during the first 12 months of an enrollment spell. Children with at least 1 month of public coverage between February 2004 and January 2008 are included in this analysis, which allows for the analysis of preventive care receipt among children who are not enrolled for a full 12-month period. Separate proportional hazard models are estimated for each state and outcome. We estimate the proportional hazard model "equivalent" of each of the logistic models described above that includes linear and quadratic time trends to capture the baseline hazard. In the hazard models, the coefficients associated with the independent variables indicate the impact of the policy change on the time until the first visit of interest.

A number of sensitivity analyses are conducted examining the effect of changing the analysis sample, estimating linear probability models in place of logistic models, using different potential comparison groups and model specifications, and controlling for health status as identified in the claims. The results are generally consistent with the main models presented here. A description of these analyses, along with their results, is available in Appendix SA2.

RESULTS

Descriptive Results

Before the implementation of the policy changes, 41 percent of children in Kentucky (Table 2) and 28 percent of children in Idaho (Table 3) had received at least one annual well-child visit. Annual rates for any preventive dental care were 37 percent for children in Kentucky (Table 2) and 55 percent for children in Idaho (Table 3) in the prereform period. As indicated in "Discussion"

below, these numbers (from the state claims data) likely understate the true provision of preventive care. In both states, younger children (under 6 years) were over twice as likely as older children (6–18 years) to receive a well-child visit in the past year, but less likely to receive a preventive dental visit. In Kentucky, nonwhite children were more likely to receive well-child visits and less likely to receive preventive dental visits, while in Idaho nonwhite children were less likely to receive both types of care.

In Kentucky, there is no observable increase in receipt of well-child care for children following the increases in reimbursement for well-child visits in 2007, but the share of children who received at least one preventive dental visit increased from 37 to 44 percent (Table 2), and the share of children who received two preventive dental visits increased from 3 to 11 percent (data not shown) following the reimbursement increase for dental care and the addition of a second annual dental visit to the benefit package in 2006. In both the pre- and postperiods, it appears that children in the analysis sample for Kentucky (i.e., those who are enrolled in a PCCM model) were less likely to have any annual well-child care than those enrolled in capitated managed care, while the rates of any annual preventive dental care are fairly similar.

In Idaho, children in nearly all age and eligibility categories experienced increases in the likelihood of receiving well-child care, with particularly large increases observed among those higher-income children in the premium-paying categories that were targeted by the incentives (Table 3). White children experienced an increase in receipt of well-child care, while nonwhites did not. Modest increases were observed in receipt of preventive dental care.

Multivariate Results

Table 4 presents key results from the logistic and hazard models. In Kentucky, there is no statistically significant association between the increase in reimbursement for well-child care and the annual probability of having any well-child visits (p-value = .908) or in the timing of the first well-child visit following enrollment (p-value = .356). Given the increased focus on preventive care embodied by the dental policy changes in the previous year, alternative well-child models were estimated using July 2006, as opposed to July 2007, as the start of the postperiod. The alternative models produce a statistically significant (p-value $< .001$), but a small, estimated impact (1 percentage point) on the probability of having any annual well-child visits relative to the preperiod and

Table 4: Impact of Policy Changes on Receipt of Well-Child and Preventive Dental Visits in Kentucky and Idaho

	*Marginal Effect**	*SE*	*p-Value*	*n*	*Presence of Comparison Group*	*Hazard Ratio*†	*SE*	*p-Value*	*N*	*Presence of Comparison Group*
Kentucky										
Well-child visit (reimbursement increase)	0.00	0.0016	.908	584,707	No	0.99	0.0059	.356	253,511	No
Preventive dental visit (reimbursement increase)	0.06	0.0014	<.001	520,122	No	1.03	0.0082	<.001	164,742	No
Idaho										
Well-child visit										
Reimbursement increase (ages 0–5)	0.03	0.0034	<.001	116,940	No	1.02	0.0104	.027	61,752	No
Wellness incentives CHIP 134–150% FPL (ages 0–5)	0.10	0.0267	<.001		0–133% FPL	1.09	0.0673	.158		0–133% FPL
Wellness incentives CHIP 151–185% FPL (ages 0–5)	0.17	0.0250	<.001		0–133% FPL	1.31	0.0717	<.001		0–133% FPL
Reimbursement increase (ages 6–18)	0.03	0.0018	<.001	194,593	No	1.39	0.0040	<.001	46,280	No
Wellness incentives CHIP 101–150% FPL (ages 6–18)‡	0.02	0.0052	.002		0–100% FPL	1.00	0.0671	.968		0–100% FPL
Wellness incentives CHIP 151–185% FPL (ages 6–18)	0.21	0.0225	<.001		0–100% FPL	1.99	0.1933	<.001		0–100% FPL
Preventive dental visit (ages 3–18)§										
Dental managed care	0.02	0.0094	.075		SSI & Foster Care	1.12	0.1102	.232		SSI & Foster Care

*Marginal effects are estimated for the probability of an annual well-child visit and the probability of an annual preventive dental visit.

†Hazard ratios are estimated for the time from enrollment in Medicaid or CHIP to the month of the child's first well-child visit or preventive dental visit.

‡Only children with family income between 134 and 150% FPL are enrolled in CHIP and therefore eligible for wellness incentives, but this group cannot be distinguished from those with family income between 101 and 133% FPL.

§Higher-income CHIP children excluded from dental analysis due to lack of full dental benefits before July 2006.

Source: State Medicaid claims and enrollment files, 2004–2008.

a 3 percent increase in the monthly likelihood of having a first well-child visit following enrollment relative to the preperiod (p-value $< .001$) (data not shown).

In the logistic and hazard models, it appears that the July/August 2006 dental policy changes in Kentucky were associated with a 6 percentage point (16 percent) increase in the probability of having any annual preventive dental visits (p-value $< .001$) relative to the preperiod and a 3 percent increase in the monthly likelihood of having a first preventive dental visit following enrollment relative to the preperiod (p-value $< .001$). Thus, the dental policy changes in Kentucky were associated with a greater likelihood of continuously enrolled children receiving any preventive dental care during a year and of newly enrolling children having a first preventive dental visit more quickly than in the preperiod. A separate specification was estimated for Kentucky in which the policy change indicator turns on in July 2007 instead to allow for a lag in the impact of the dental policy changes. This specification suggested slightly larger impacts (of 7 percentage points in the logistic model and of 7 percent in the hazard model) relative to the preperiod (data not shown).

In Idaho, the reimbursement increase for well-child care was associated with a 3 percentage point increase in the probability of receiving any well-child visits for both age groups relative to the preperiod, representing a 6 percent increase for younger children (p-value $< .001$) and a 19 percent increase for older children (p-value $< .001$). The hazard models indicate that the fee increase was associated with a 2 percent increase in the monthly likelihood of having a first well-child visit following enrollment for younger children (p-value $= .027$) relative to the preperiod and a 39 percent increase for older children (p-value $< .001$) relative to the preperiod. Models estimated using the Medicaid sample only (i.e., those not targeted by the incentives) produced findings consistent with those including all eligibility groups together (data not shown).

The Idaho wellness incentives targeted at the premium-paying CHIP groups were associated with increased well-child visit receipt for both CHIP categories of younger children (10 and 17 percentage points, respectively) and for the 151–185 percent FPL category of older children (21 percentage points), corresponding to increases in the probability of receiving an annual well-child visit of 20, 32, and 113 percent relative to their comparison groups, respectively (p-value $< .001$ for all three estimates). A smaller association (of 2 percentage points) was found between increased well-child visit receipt and the introduction of the incentives for the 101–150 percent FPL category among older children (p-value $= .002$) relative to those in the under 101 percent FPL

category, which is likely because so many children in this eligibility category were not eligible for the incentives. Because only 25 percent of this group was affected by the wellness incentives, we estimate that the effect of the treatment on the treated is approximately 4 times this amount, or 8 percentage points. Children in the higher-income CHIP category targeted by the incentives experienced large increases in the monthly likelihood of having a first well-child visit following enrollment (of 31 percent for younger children relative to younger children in the comparison group not targeted by the incentives [p-value $< .001$] and 99 percent for older children relative to the older children in the comparison group not targeted by the incentives [p-value $< .001$]), but the effects found in the hazard models for both younger and older children in the lower-income CHIP category relative to the comparison group were not statistically significant at conventional levels (p-value = .158 and .968, respectively).

The multivariate results suggest that adoption of managed care for dental services in Idaho was associated with a small, marginally significant 2 percentage point increase in the probability of receiving a preventive dental visit among nondisabled children targeted by the policy change (p-value = .075), representing a 4 percent increase relative to changes occurring for the comparison group of children in Medicaid who were enrolled in SSI and Foster Care. The policy change was also associated with a 12 percent increase in the monthly likelihood of having a first preventive dental visit for nondisabled children following enrollment relative to the comparison group, although this finding is not statistically significant (p-value = .232). As indicated in Appendix SA2, there is a possibility that the move to managed care could have had positive spillover effects on the children who remained in traditional fee-for-service for dental care, and in fact, slightly stronger managed care effects were found in simple pre–post models.

Additional analyses (see Appendix SA2) suggest that there may be lagged effects or changes in trend due to the reforms on receipt of well-child and preventive dental care in both Kentucky and Idaho, meaning that we may understate the longer-run effects of these policy changes on receipt of care.

DISCUSSION

This analysis suggests that state Medicaid/CHIP policy changes such as reimbursement increases, incentives, and delivery system changes may be

associated with greater preventive care receipt among publicly insured children. By using hazard analyses, which have not been used in prior research to study these issues, our work also provides new insights into how policy changes can influence the timing of preventive care receipt following enrollment in Medicaid/CHIP. Given the paucity of research on Medicaid policy changes and the limitations to our analytic approach driven largely by data constraints, more research is needed on this topic. Stronger research designs will require new data investments, because no data are currently available to track the receipt of well-child and preventive dental care for publicly enrolled children in each state consistently over time or to measure Medicaid reimbursement rates for such visits.

In Kentucky, the dental policy changes that were adopted were associated with an increased likelihood of receiving preventive dental care and earlier receipt of such care following enrollment. The combination of the introduction of a second covered preventive dental visit, the 30 percent dental reimbursement rate increase (compared with the 12.5 percent increase for well-child visits), and the longer postperiod observed for dental changes (24 months) compared with well-child changes (12 months) may have contributed to the stronger dental findings. In Idaho, it appears that it might have been slightly easier for families to obtain preventive dental care for their children under managed care relative to the prior fee-for-service system, which is consistent with reports that the number of dentists accepting Medicaid/CHIP increased (Kenney and Pelletier 2010), although the effects are small and only marginally significant in our main model specification. While the reimbursement rate increases for well-child visits were associated with small increases in the receipt of preventive care in Idaho, no consistent effects were found for Kentucky.

The new wellness incentives introduced in Idaho appeared to increase rates of well-child care by a substantial amount among the children targeted by the incentives. Similar attempts at rewarding beneficiaries for obtaining preventive care in California, Pennsylvania, and Florida have had mixed results, as states have struggled to make beneficiaries aware of and encourage redemption of the rewards (Redmond, Solomon, and Lin 2007; Coughlin et al. 2008). The automatic redemption of rewards (i.e., premium offset) in Idaho's program may be a unique feature which contributed to its success. In fact, the share of children who lost coverage due to failure to pay premiums dropped from 15 to 20 percent before introduction of the incentives to 4 percent in state fiscal year 2008 and less than 1 percent in state fiscal year 2009 (Kenney and Pelletier 2010). However, despite the apparent success of the incentives in

Idaho, the overall increase in well-child receipt was low in the state because such a small percentage of enrolled children (just around 11 percent) were eligible for the benefit. Moreover, children in Idaho's premium-paying CHIP categories are substantially more likely than children in Medicaid to receive well-child care, raising equity concerns. The state currently has no plans to expand the program to Medicaid children due to budget constraints and the lack of a CMS-approved mechanism for rewarding families who are not required to pay premiums. These challenges, along with our findings that suggest demand-side initiatives in Idaho may have produced substantial increases in well-child visit receipt, demonstrate the need for further research on ways that states can incentivize families to seek preventive care for their publicly insured children.

There are a number of limitations to this analysis. First, the reliance on a pre–post design to identify impacts may not adequately control for confounding changes in case mix or service delivery systems that could affect preventive care receipt for children covered by Medicaid/CHIP. Although previous case study work did not identify any major changes that would have confounded the analysis of these policy changes, that possibility cannot be ruled out (Kenney, Pelletier, and Costich 2010). Second, experiences of children who are served exclusively by community health centers and rural health clinics in Idaho could not be examined due to the lack of claims data on visits to these providers.

Third, coding practices may bias downward the estimates of the extent to which children are receiving preventive care based on claims data (Steinwachs et al. 1998) and the new incentives may have led to more coding of preventive care during primary care visits in Idaho and not to an increase in the receipt of well-child care. However, we found no evidence in Idaho of offsetting decreases in nonpreventive primary care among the higher-income CHIP category of children in either age group or among the younger children in the lower-income CHIP category, which were the groups where the largest increases in preventive service receipt were observed (data not shown). Therefore, it appears that the increased reported receipt of well-child care in these three premium-paying categories may reflect greater provision of well-child care and not simply changes in coding. Fourth, the impact estimates should be interpreted as early impacts since the postperiod is short for many of the analyses. Though we ran sensitivity analyses that suggested a small lagged effect or a change in trend, we cannot be sure of the long run effect of the reforms. Finally, the analysis provides no information on the content of the preventive care that is being provided or whether the increased receipt of

preventive care led to improvements in child health and functioning. More research is needed on that question.

The recently enacted Patient Protection and Affordable Care Act (PL 111–148) mandates an increase in Medicaid reimbursement for primary care services provided by primary care physicians up to Medicare levels in 2013 and 2014, paid entirely by the federal government. This provision, designed to address access problems in Medicaid, should increase rates in Kentucky by about 17 percent on average but will have little or no effect on rates in Idaho since that state already reimburses Medicaid providers at or above Medicare rates (American Academy of Pediatrics 2009).

While this analysis suggests that Medicaid programs may be able to improve preventive care receipt through the use of demand and supply side initiatives such as increased reimbursement rates, incentives, and changes in the service delivery system, rates of well-child and preventive dental visits still fall short of recommended guidelines in both states even after implementation of the policy changes. The modest impacts we find for most of the policy changes we examine suggest that behavior change around prevention is difficult even when financial incentives are better aligned. Thus, Medicaid programs may need to address other factors (e.g., training, perceived gaps in cultural competence, negativism about Medicaid) that limit the supply of Medicaid providers (Edelstein 2009). However, national survey data suggest that Kentucky and Idaho may be performing on par with other public programs in terms of children's preventive care use and that receipt of preventive care may actually be higher in Kentucky and Idaho among children with public insurance than among children with private coverage (National Survey of Children's Health 2007). Thus, increasing the receipt of preventive care for children may require addressing both demand and supply side barriers, regardless of insurance type.

To meet recommended targets, states may want to consider conducting outreach about the benefits of preventive care and testing alternative approaches for rewarding both families and providers for preventive care provision. For example, states with PCCM models may need to give primary care providers greater incentives to increase preventive care receipt and to make appropriate referrals when follow-up care is needed. Addressing access to specialty care for children in Medicaid/CHIP may also be needed so that providers can make appropriate referrals to ensure that children receive needed follow-up care for problems that are diagnosed during preventive visits. Finally, in order for states to adequately monitor preventive care receipt and to ensure that the services that are provided to individual children are

tailored to their specific health needs and risks, Medicaid/CHIP claims and encounter data may need to include additional fields on the child's health status and risk factors and on the procedures and counseling occurring during visits (Schor 2004; Bergman, Plsek, and Saunders 2006).

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Disclaimers: None.

NOTES

1. Average reimbursement amounts and percent increases reflect a simple average of the reimbursement rates charged for new and established patients ages 0–17 as reported on the archived fee and rate schedules available on both states' Medicaid websites.
2. A supplemental appendix available online (include link) includes additional information on the data and methods used in this analysis.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.
Appendix SA2: Methodological Appendix.

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